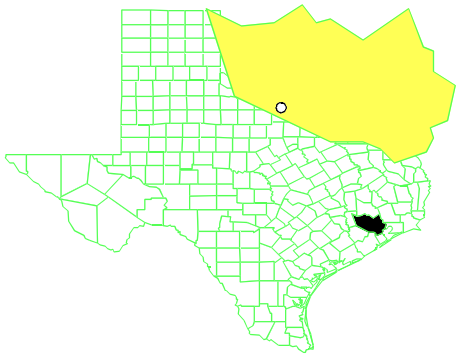
CRYSTAL CHEMICAL COMPANY

TEXAS

EPA ID# TXD990707010



EPA REGION 6
Congressional District 22
Harris County

Updated: 03/31/00

Site Description

Location:
- 3502 Rogerdale Road, Harris County, Texas.
- Residential and light industry area.

Population:
- Approximately 20,000 people live within a one-mile radius of the site.

Setting:
- The nearest residence is 2500 feet.
- The nearest drinking water well is 300 feet.
- 20 water wells exist within one-mile radius.
- The site covers approximately 5 acres.

Hydrogeology:
- Soils at the site are mostly silty clay and sandy clay (poorly drained).
- The 35-foot sand aquifer is contaminated with less than 600 parts per million (ppm) of arsenic.
- The 35-foot sand appears to be confined from the lower aquifers (100-foot sand) by a 10-foot clay zone with a migration rate of 0.1 ft/year.
- Drinking water supply wells completed in the Chicot Aquifer.
- The site is located within the 100-year flood plain.

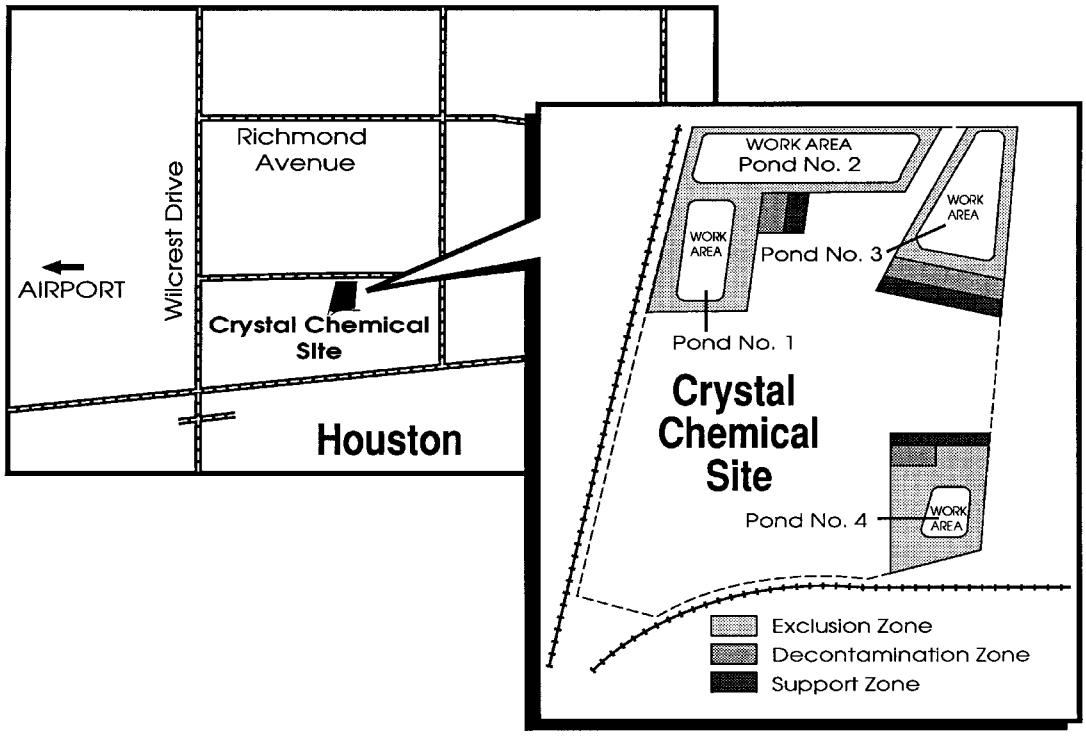
Wastes and Volumes

- The principal pollutant at the Crystal Chemical site is arsenic.
- The on-site subsurface (4 ft.) concentration is high, at approximately 27,000 ppm.
- The ground water (35-foot sand) arsenic concentration is less than 600 ppm.
- 3 on-site waste ponds, also highly contaminated, contain approximately 16,500 cu. yds.
- The total site quantity is approximately 156,000 cubic yards of soil, and 3 million gallons of water.
- The approximate volume of contaminated soils off-site is 25,000 cubic yards.

Site Assessment and Ranking

NPL LISTING HISTORY
Site HRS Score: 60.90
Proposed Date: 7/23/82
Final Date: 9/08/83
NPL Update: No. 1

Site Map and Diagram



The Remediation Process

Site History:

! The Crystal Chemical site was an active herbicide plant from 1968 until 1981, when bankruptcy was declared.
! From September 1981 through February 1983, EPA de-watered the site, filled in contaminated ponds, temporarily capped most of the plant site with 6 inches of clay, and added top soil and seed.
! Hurricane damage to the site resulted in a restart of work. Restart actions included repairing the fence, removal of contaminated liquids from two buildings, capping building floor, and installation of gravel berms.
! In September/October 1983 and August through October 1988, EPA made repairs to the clay cap and site fence.
! Removal actions by EPA resulted in 400 cubic yards of soils and 2 million gallons of contaminated water being removed from this site.
! The Remedial Investigation (RI) was completed in January 1984
! The Feasibility Study (FS) was completed in June 1984, with an Addendum Study completed in December 1984, and a Supplemental FS was completed in September 1990.
! From October 1990 through September 1991, the Potentially Responsible Party (PRP), removed additional contaminated soils from the Westpark Drive easement and made repairs to the cap and the Harris County Flood Control Ditch.

Health Considerations:

! Raw and finished materials from the manufacturer of arsenic-based pesticides were spread on surface soils and have leached into the ground.
! Potential chronic human exposure risks include the risk of skin and lung cancer from direct contact with, and ingestion of, contaminated soils and ground water, and inhalation of contaminated dust.

Other Environmental Risks:

! Shallow ground water was discharging into a Harris County flood control ditch. This ground water near the flood control ditch is currently being pumped and is being treated onsite. The shallow ground water contamination beneath previous holding ponds has migrated north and south beyond the site boundary.

Record of Decision

Signed: September 27, 1990
Amended: June 16, 1992
Explanation of Significant Differences
- Ground Water
March 19, 1997

Soils

! In September 1990, EPA issued a Record of Decision (ROD) that addressed soil and ground water contamination. The selected remedy for soils called for the excavation of offsite soils contaminated with arsenic greater than 30 parts per million (ppm), treating all the soils contaminated with arsenic greater than 300 ppm with a process called in-situ vitrification, and capping the entire site after the soils treatment had been completed. Due to the unavailability of the in-situ vitrification technology, EPA selected a new soil remedy in a ROD amendment issued in June 1992. The soil consolidation and capping remedy was completed in September 1995.

Ground Water:

! During the course of the design for the extraction and treatment of arsenic-contaminated ground water identified in the 1990 ROD, the EPA and Texas Natural Resource Conservation Commission (TNRCC) determined that restoration of the ground water is technically impracticable for portions of the site. Therefore, EPA in the March 19, 1997 Explanation of Significant Differences stated that the applicable or relevant and appropriate requirement (ARAR) for ground water restoration to the Maximum Contaminant Level (MCL) of 50 ug/l for arsenic be waived and a slurry wall be constructed around portions of the site where ground water cannot be restored. The extraction and treatment of arsenic-contaminated ground water is occurring on the remainder of the site, as specified in 1990 ROD. Partial construction of the slurry wall has been completed on the site. However, completion of the slurry wall on an adjoining property owner's land is currently delayed pending resolution of property access issues.

Other Remedies Considered	Reason Not Chosen
SOIL	
1. "No Action"	Did not meet remedial objectives
2. Limited Action	Did not meet remedial objectives
2. Excavation and Off-Site Disposal	Difficult to implement
3. Full or Partial In-Situ Vitrification	Technology not available
4. Full or Partial Solidification/Stabilization	Poor treatment success
5. Full or Partial Soil Washing	Difficult to implement
GROUND WATER	
1. "No Action"	Did not meet remedial objectives
2. Limited Action	Did not meet remedial objectives
3. Slurry Wall Containment	Did not meet remedial objectives
4. Extraction and Discharge to POTW (not treated)	Did not meet remedial objectives

Community Involvement

- Community Involvement Plan: Developed 8/89 , revised 2/91
- Open houses and workshops: 4/90, 6/90, 2/92, 10/94
- Original Proposed Plan Fact Sheet and Public Meeting: 6/90.
- Original ROD Fact Sheet: 10/90
- Milestone Fact Sheets: 4/85, 11/87 (by PRPs), 1/91, 9/94, by PRPs
- EPA Amended Proposed Plan and Public Meeting held : 2/92
- Proposed Ground Water Explanation of Significant Differences (ESD) Fact Sheet: 7/96
- Citizens on site mailing list: 183
- Constituency Interest:
  - Community concerns about site aesthetics after the remedy is completed.
  - Political inquiries regarding the length of time required to effect the cleanup.
- Outreach activities with PRPs completed Fall 1994
- Site Repository: Jungman Public Library, 5830 Westheimer Road, Houston, TX 77057

Technical Assistance Grant

- Availability Notice: 4/89
- Letters of Intent Received: 1) LIFT Endowment, Inc. - 2/8/90 (later withdrawn) 2) Westchase Business Council - 4/2/90
- Final Application Received: 6/11/91
- Grant Award: 8/16/91
- Current Status: TAG closed.

Contacts

- **Remedial Project Manager (EPA):** Chris Villarreal, 214-665-6758, Mail Code: 6SF-AP
- **State Contact:** (TNRCC) Alan Etheredge, 512/239-2139
- **Region 6 Ombudsman (EPA):** Arnie Ondarza, 214-665-6790, Mail Code: 6SF
- **Community Involvement Coordinator (EPA):** Donn Walters, 214-665-6483, Mail Code: 6SF-P
- **Attorney (EPA):** Ann Foster, 214-665-2169, Mail Code: 6SF-DL
- **State Coordinator (EPA):** Karen Bond, 214-665-6682, Mail Code: 6SF-AP
- **Prime Contractor:** ERM Southwest, Inc. (for PRPs)

Enforcement

- Southern Pacific Transportation Company committed to do a supplemental Feasibility Study in a Consent Order signed on April 28, 1987.
- An Administrative Order was issued in may 1991 to PRPs regarding excavation of contaminated soils from the Westpark Drive easement.
- An Administrative Order was issued to Southern Pacific Transportation Company in March 1992 for the ground water Remedial Design.
- An Unilateral Administrative Order was issued to Southern Pacific Transportation Company in September 1992 for ground water remedial action and the soil Remedial Design/Remedial Action.

Present Status and Issues

- Emergency actions to remove or cap contaminated soils and liquid wastes, as well as repair and upkeep activities, have reduced the actual exposure potential and the migration of contaminated ground water at the Crystal Chemical Company site, making it safer while cleanup continues.
- During the development of the remedial design for the ground water remedy, it was determined that it is technically impracticable to implement the ground water remedy for a large portion of the contaminated ground water plume due to hydrogeologic factors and contaminant related factors. Where technically practicable, contaminated ground water is currently being extracted and treated on-site. An Explanation of Significant Differences (ESD) identifying the use of a slurry wall for portions of the site were it was determined technically impracticable to restore the ground water was issued on March 19, 1997. The slurry wall will, once constructed, contribute to the long-term management of contaminant migration by limiting the further contamination of ground water. The slurry wall would also permit restoration of the portion of the contaminated plume that would lie outside the containment area. During the formal public comment period for the ESD, the only comments received were from an adjacent landowner. The EPA issued a responsiveness summary as an attachment to the ESD which addressed these comments.
- The remedial design for the soil remedy was finalized in January 1995. Remedial Action (construction) was completed in September 1995.
- Partial construction of the slurry wall has been completed on the site. However, completion of the slurry wall on an adjoining property owner's land is currently delayed pending resolution of property access issues. Once access is obtained, an additional ground water investigation will occur. The primary purpose of the additional ground water investigation will be to ensure the slurry wall encompasses the arsenic plume by defining the northeastern extent of arsenic-affected ground water exhibiting concentrations of 50 parts per billion or more. A secondary objective of the additional ground water investigation will be to assess whether migration has stopped since the source material was removed in 1995 as part of the Soil Remedial Action. If the data demonstrate that migration has not occurred, additional work will be conducted to evaluate the potential for eliminating the construction of slurry wall and conducting long-term ground water monitoring.

Benefits

! Removal actions by EPA resulted in 400 cubic yards of soils and almost 2 million gallons of contaminated water being removed from this site.
! Site cleanup will reduce health risks for over 20,000 residents living within one mile of the site.